Seals and sea lions: Indicators of marine ecosystem condition at Point Reyes

By Sarah Allen

PARK RESOURCE MANAGERS are identifying species that can give them insights into the condition of natural systems in the nation's parks through the Inventory and Monitoring Program, a major component of the Natural Resource Challenge. Changes in populations of top predators, for example, provide early warning signals of disruptions in natural systems. Seals and sea lions, as the apex predators of Pacific Ocean marine ecosystems, were selected in 2003 by the San Francisco Bay Network as indicators for ecosystem condition at Point Reyes National Seashore.

Seals and sea lions, known as pinnipeds, are excellent indicators because the protocols for monitoring these animals are well established and easily implemented. Additionally, other marine parks and agencies, including Channel Islands National Park and the National Oceanic and Atmospheric Administration, monitor pinnipeds, providing opportunities for regional collaboration on analysis. These animals also have special status under the Marine Mammal Protection Act because of special requirements for their protection and, in some cases, because of the precarious status of species.

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Monitoring at the seashore focuses on the two breeding species of pinnipeds, harbor seals (*Phoca vitulina richardii*) and northern elephant seals (*Mirounga angustirostris*), although six species of pinnipeds occur there. The topographic and hydrographic complexity of the coastal zone of Point Reyes National Seashore provides diverse habitats for seals and their prey. Harbor seals are the dominant and most widespread pinniped in the park, hauling out throughout the year at nine terrestrial sites. Point Reyes National Seashore is also the northernmost breeding colony for northern elephant seals.

Since 1976, researchers have monitored seal colonies at Point Reyes National Seashore to detect changes in population numbers and reproductive success and to identify factors that might affect population trends. During surveys, staff and trained volunteers collect demographic data, including the total number of animals by sex and age class and number of pups. Information is also collected on environmental factors (e.g., weather, shoreline changes) and human disturbances (e.g., sources of disturbance impacts on seal behavior).

Northern elephant seals (left and right) congregate to breed at Point Reyes National Seashore, California, home of the northernmost colony of these animals. Six species of seals and sea lions, federally protected marine mammals, occur at Point Reyes. Park managers are monitoring seal colonies to detect changes in natural systems and to adaptively manage park resources and activities to benefit seal populations.

Biologists have determined that populations of both species have increased significantly within the seashore over the past 20 or more years; however, individual colonies have experienced uneven recovery rates depending upon human activities. Point Reyes National Seashore has responded with various adaptive management strategies. At Drakes Estero, for example, park managers detected a decline in population numbers and determined that increased kayak use was disturbing the breeding seals. In response the park instituted a seasonal closure of the area to kayaking, and the recovery of the colony was documented in subsequent breeding seasons.

Monitoring several colonies has allowed biologists to distinguish broad-scale environmental effects, such as climate variability from human-caused disturbances, on individual colonies. Researchers may also detect regional or global trends by linking regional pinniped monitoring data with other indicators such as water quality, weather, and marine fish populations. The scientific information obtained through monitoring gives park managers a better understanding of how to sustain and restore species like the seals of Point Reyes National Seashore. ■

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NPSFACT

Visitors to the approximately 270 national park units that are considered to have **significant natural resources** (I&M parks) numbered 231.6 million in 2002, or **84% of total visitation** in the National Park System. Visitation at the I&M parks dropped 0.6 million from 2000 to 2002 compared to an overall decline in National Park System visitation of 8.6 million for the same period.